

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

To:

see form PCT/ISA/220

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/EP2004/007949

International filing date (day/month/year)
16.07.2004

Priority date (day/month/year)
17.07.2003

International Patent Classification (IPC) or both national classification and IPC
E21B34/04, F16K31/04

Applicant
COOPER CAMERON CORPORATION

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Authorized Officer

Bellingacci, F

Telephone No. +49 89 2399-2784



**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/EP2004/007949

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/EP2004/007949

Box No. II Priority

1. ☒ The following document has not been furnished:
- ☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).
 - ☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).
- Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.
2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
3. ☐ The International Searching Authority has not been able to consider the validity of the priority claim because a copy of the earlier application whose priority has been claimed was not available to the International Searching Authority at the time that the search was conducted (Rule 17.1). This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.
4. Additional observations, if necessary:

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees, the applicant has:
- ☐ paid additional fees.
 - ☐ paid additional fees under protest.
 - ☒ not paid additional fees.
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
- ☐ complied with
 - ☒ not complied with for the following reasons:
see separate sheet
4. Consequently, this report has been established in respect of the following parts of the international application:
- ☐ all parts.
 - ☒ the parts relating to claims Nos. 1-5,23,24,32,33

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/EP2004/007949

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	2,4,5,23,24,32,33
	No: Claims	1,3
Inventive step (IS)	Yes: Claims	
	No: Claims	1-5,23,24,32,33,35
Industrial applicability (IA)	Yes: Claims	1-5,23,24,32,33,35
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Reference is made to the following documents:

D1 = GB 896 896 A
D2 = US 863 180 A
D3 = US 3 159 038 A

Re Item IV

Lack of unity of invention

V-1 The subject-matter of claim 1 is not new, see following point V-1. As no feature of claim 1 defines "a contribution of the prior art" (in the meaning of Rule 13.2 PCT) claim 1 comprises no "special technical features" (again in the meaning of Rule 13.2 PCT).

For completeness it is pointed out that the subject-matter of claim 1 is not new also in the light of D2, see fig. 1 and 2.

First group of inventions

The contribution of claim 2 over the prior art is that the spindle drive is a recirculating roller or ball spindle drive. This feature is therefore considered as the "special technical feature" of claim 2.

The problem solved by this feature is to provide for a spindle drive featuring a long service life, see description of the present application, page 2, line 11.

Even though claims 3 to 5, 23, 24, 32 and 33 (at least seen as dependent directly on claim 1) do not specify features relating to recirculating balls or rollers, they are still considered as part of the first group of invention and searched in the light of PCT Guidelines, PCT/GL/ISPE/1 10.64 and 10.65).

Second group of inventions

The contribution of claim 6 over the prior art (at least considering claim 6 as directly dependant on claim 1) is that the reduction gear comprises a harmonic drive. This feature is therefore considered as the "special technical feature" of claim 6.

The problem solved by this feature is to provide for a reduction gear wherein even extremely slight adjustments to the corresponding actuating element are possible

and accurately controllable (see description, page 2, lines 7, 8).

Claims 7 to 10, 22 and 35 relate to features which may be used in combination with an harmonic drive and therefore said claims are considered part of the second groups of inventions.

Third group of inventions

The contribution of claim 11 over the prior art (at least considering claim 11 as directly dependant on claim 1) is that the spur gear is helically toothed. This feature is therefore considered as the "special technical feature" of claim 6.

The problem solved by this feature is to permit to maintain the advantages of a spur gear while permitting, in case through particular further embodiments, a simple release of self-locking or self braking (page 3, lines 24-27).

Claims 12 to 21 specify features relating to helical gear and therefore said claims belong to the third groups of inventions.

Fourth group of inventions

The contribution of claim 25 over the prior art (at least considering claim 25 as directly dependant on claim 1) is that a position sensor is assigned to the axially movable part of the spindle drive. This feature is therefore considered as the "special technical feature" of claim 25.

The problem solved by this feature is to permit to monitor the movement of the actuating element and possible use said movement for the control of the drive device (page 6, lines 22 - 24).

Claims 26-28, 31 and 34 specify features relating to the determination of the position of the actuating elements, and therefore said claims are considered as belonging to the third groups of inventions.

Fifth group of inventions

The contribution of claim 29 over the prior art (at least considering claim 29 as directly dependant on claim 1) is that a distance sleeve is arranged in a motor hole of the device housing. This feature is therefore considered as the "special technical feature" of claim 29.

The problem solved by this feature is to permit a modular construction of the drive device permitting the use of one or more motors (page 7, lines 14-29).

The problem of increasing modularity is solved, even though by means of unrelated features, by the features of claim 30, and therefore also claim 30 is considered as belonging to the fifth group of inventions.

The "special technical features" of the five groups of inventions are therefore different, solve different problems, can be used independently one from the other and if used in combination no unexpected synergetic effect appears. The "special technical features" of the five groups of inventions are therefore not technically related and the requirements of Rule 13.2 PCT are not met.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

V-1 D1, (GB 896 896) which is considered as the closest prior art, describes a drive device (see title) for the adjustment of an actuating element of a valve with at least one spindle drive (*fig. 1, see threaded spindle 2 and cooperating threaded bush 3*) movably connected to the actuating element and a gear unit (*fig. 1*) arranged between the spindle drive and at least one motor (page 2, lines 98-100), wherein the gear unit exhibits a reduction gear (15+18) assigned to the spindle drive and a spur gear (*89, page 3, lines 34-36*) assigned to the motor.

As the features which are further specified in claim 1 are qualified by expressions as "in particular", they are to be considered as optional and not limiting the scope of the claim (PCT/GL/ISPE/I 5.40), and it results therefore that the subject-matter of claim 1 is not new.

V-2 The spindle drive according to D1 does not comprise recirculating rollers or balls, and therefore the subject-matter of claim 2 is new. This type of drives is however routinely used in valves actuating systems (see D3, col. 2, lines 71 and *fig. 1*), and the subject-matter of claim 2 does not meet therefore the inventive step requirement of Art. 33(3) PCT.

V-3 The spindle nut 3 of the drive according to D1 is supported rotationally, but axially

immovably in housing 1, and the subject-matter of claim 23 is therefore not new (at least with claim 3 considered as depending directly on claim 1.)

- V-4 The features specified in further claims 4-5, 23, 24, 32 and 33 (as far as said claims can be understood, see following point VIII-1) represent obvious alternatives to the features disclosed in D1 to D3, and therefore said claims do not meet the inventive step requirement of Art. 33(3) PCT.

Re Item VIII

Certain observations on the international application

- VIII-1 The indiscriminate use of the expression "according to one of the previous claims" as used in claims 3 to 35 is unclear, as in the large majority of cases these claims refer to features which are not defined earlier up in the dependancy chain. Just as an example, claim 7 refers to a "toothed sleeve (12)", which toothed sleeve is fully defined first in claim 6. Claim 7 however is formulated as dependent "on one of the previous claims", whereby all of embodiments deriving from combining claim 7 with any of the previous claims but claim 6 are undefined.